

John Herschel Fike

Associate Professor

Department of Crop and Soil Environmental Sciences

Virginia Polytechnic Institute and State University

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EDUCATION

PhD, Ruminant Nutrition, University of Florida, 1999

Dissertation: Grazing systems and management strategies for lactating Holstein cows in Florida

MS, Forage Agronomy, Virginia Tech, 1995

Thesis: Influence of seaweed extract and other plant growth regulators on growth, persistence, and quality of tall fescue and their potential to alleviate tall fescue toxicity to livestock

BS, Science Education, Wake Forest University, 1988

PROFESSIONAL EXPERIENCE

Associate Professor, Crop and Soil Environmental Sciences, Va Tech, June 2006 to present

Assistant Professor, Crop and Soil Environmental Sciences, Va Tech, Mar 2000 – June 2006

Research Assistant, Dairy and Poultry Sciences, U. Florida, May 1995 – Dec 1999

Research Assistant, Crop and Soil Environmental Sciences, Va Tech, Sept 1992 – May 1995

PUBLICATIONS

Refereed Journal Articles

Pease, J.A., J.H. Fike, V.N. Owens, R.L. Farris, J.L. Hansen, E.A. Heaton, H.S. Mayton, R.B. Mitchell, D.R. Viands. 2017. Switchgrass Nitrogen Response and Cost of Production on Diverse Sites. GCB Bioenergy. Accepted.

Gray, D.J., H. Baker, K. Clancy, R. C. Clarke, K. deCesare, J. Fike, M. J. Gibbs, F. Grotenhermen, N. C. Kane, K. G. Keepers, D. P. Land, R. C. Lynch, J. P. Mendieta, M. Merlin, K. Müller-Vahl, C. S. Pauli, B. J. Pearson, B. Rhan, T. C. Ruthenberg, C. J. Schwartz, S. B. Tittes, D. Vergara, K. H. White, R. N. Trigiano. 2016. Current and future needs and applications for cannabis. Critical Reviews in Plant Sciences. In Press.

Fike, J.H. 2016. Industrial hemp: Renewed opportunities for an ancient crop. Critical Reviews in Plant Sciences. Invited Review.

<http://www.tandfonline.com/eprint/EWenPXEVizg6ZV5v3YWP/full>

¹Liu, X. J. A.; Fike, J. H.; Galbraith, J. M.; Fike, W. B. 2015. Biosolids amendment and harvest frequency affect nitrogen use dynamics of switchgrass grown for biofuel production. BioEnergy Research 8:560-569.

¹Liu, X. J. A.; Fike, J. H.; Galbraith, J. M.; Fike, W. B.; Parrish, D. J.; Evanylo, G. K.; Strahm, B. D. 2015. Effects of harvest frequency and biosolids application on switchgrass yield, feedstock quality, and theoretical ethanol yield. GCB Bioenergy 7:112-121.

Hong C., V. Owens, D. Bransby, R. Farris, J. Fike, E. Heaton, S. Kim, H. Mayton, R. Mitchell, D. Viands. 2014. Switchgrass response to nitrogen fertilizer across diverse environments in the USA: a regional feedstock partnership report. BioEnergy Research.7:777-788.

¹Liu, X. J. A.; Fike, J. H.; Galbraith, J. M.; Fike, W. B. 2014. Switchgrass response to cutting frequency and biosolids amendment: biomass yield, feedstock quality, and theoretical ethanol yield. BioEnergy Research 7:1191-120.

Owens, V. N., D. R. Viands, H. S. Mayton, J. H. Fike, R. Farris, E. Heaton, D. I. Bransby, and C. O. Hong.. 2014. Switchgrass Response to Nitrogen Fertilizer across Diverse Environments in the USA: A Regional Feedstock Partnership Report. BioEnergy Research 7 (3): 777–88. doi:[10.1007/s12155-014-9484-y](https://doi.org/10.1007/s12155-014-9484-y).

¹ Graduate student

- Owens, V.N., D.R. Viands, H.S. Mayton, J.H. Fike, R. Farris, E. Heaton, D.I. Bransby, and C.O. Hong. 2013. Nitrogen use in switchgrass grown for bioenergy across the USA. *Biomass and Bioenergy* 58:286-293.
- Rushing, J.B., B.S. Baldwin, A.G. Taylor, V.N. Owens, J.H. Fike, and K.J. Moore. 2013. Seed safening from herbicidal injury in switchgrass establishment. *Crop Sci.* 53:1-8.
- ¹Johnson, J.W. J.H. Fike, W.B. Fike, J.A. Burger, J.F. Munsell, J.R. McKenna, and S.C. Hodges. 2013. Millwood honeylocust trees: seedpod nutritive value and yield characteristics. *Agroforestry Systems*. 87:849-856.
- ¹Johnson, J.W. J.H. Fike, W.B. Fike, J.A. Burger, J.F. Munsell, J.R. McKenna, and S.C. Hodges. 2012. Millwood and wild type honeylocust seedpod digestibility, nutritive value, and mineral concentrations over winter. *Crop Science*. 52: 2807–2816.
- ¹Boland, H. T.; Scaglia, G.; Notter, D. R.; Rook, A. J.; Swecker, W. S.; Abaye, A. O.; Fike, J. H. 2011. Grazing behavior and diet preference of beef steers grazing adjacent monocultures of tall fescue and alfalfa: I. spatial allocation. *Crop Sci.* 51:1815-1823
- ¹DeBruyne, S. A.; Feldhake, C. M.; Burger, J. A.; Fike, J. H. 2011. Tree effects on forage growth and soil water in an Appalachian silvopasture. *Agroforestry Systems* 83:189-200.
- ¹McGrath, S., R. Maguire, B. Tracy, J. Fike. 2010. Improving soil nutrition with poultry litter application in low input forage systems. *Agron. J.* 102:48-54.
- Cundiff J., J. Fike, D. Parrish, J. Alwang. 2009. Logistic constraints in developing dedicated, large-scale, bioenergy systems in the Southeastern USA. *J. Environmental Eng.* 135: 1086-1096.
- Parrish D., J. Fike, D. Bransby, R. Samson. 2008. Establishing and managing switchgrass as an energy crop. *Forage and Grazinglands* doi:10.1094/FG-2008-0220-01-RV.
- Bransby D., R. Samson, D. Parrish, J. Fike. Harvest and conversion systems for producing energy from switchgrass. *Forage and Grazinglands* doi:10.1094/FG-2008-0722-01-RV
- Scaglia G., W. Swecker, Jr., J. Fontenot, D. Fiske, J. Fike, A. Abaye, W. Clapham, J. Hall. 2008. Forage systems for cow-calf production in the Appalachian region. *J. Anim. Sci.* 86:2032-2042.
- Fike, J.H., D.J. Parrish, J. Alwang, and J.S. Cundiff. 2007. Challenges for deploying dedicated, large-scale, bioenergy systems in the USA. *Invited review. CAB Reviews: Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources* 064:1-28.
- ¹Buergler, A.L., J.H. Fike, J.A. Burger, C.M. Feldhake, J.R. McKenna, and C.D. Teutsch. 2006. Forage nutritive value in an emulated silvopasture. *Agronomy J.* 98:1265-1273.
- Fike, J.H., D.J. Parrish, D.D. Wolf, J.A. Balasko, J.T. Green, Jr., M. Rasnake, and J.H. Reynolds. 2006. Switchgrass production for the upper southeastern USA: Influence of cultivar and cutting frequency on biomass yields. *Biomass and Bioenergy*. 30:207-213.
- Fike, J.H., D.J. Parrish, D.D. Wolf, J.A. Balasko, J.T. Green, Jr., M. Rasnake, and J.H. Reynolds. 2006. Long-term yield potential of switchgrass-for-biofuel systems. *Biomass and Bioenergy*. 30:198-206.
- ¹Buergler, A.L., J.H. Fike, J.A. Burger, C.M. Feldhake, J.R. McKenna, and C.D. Teutsch. 2005. Botanical composition and forage production in an emulated silvopasture. *Agron. J.* 97:1141-1147.
- Fike, J.H., K.E. Saker, S.F. O'Keefe, N.G. Marriott, D.L. Ward, J.P. Fontenot, H.P. Veit. 2005. Effects of Tasco (a seaweed extract) and heat stress on N metabolism and meat fatty acids in wether lambs fed hays containing endophyte-infected fescue. *Small Rum. Res.* 60:237-245.
- Fike, J.H., Teutsch, C.D., and Ward, D.L. 2005. Warm-season grass production responses to site and defoliation frequency. *Forage and Grazinglands* Eight pp.
<http://www.plantmanagementnetwork.org/pub/fq/research/2005/warm/>

¹ Graduate student

- Parrish, D.J., and J.H. Fike. 2005. The biology and agronomy of switchgrass for biofuels. *Critical Reviews in Plant Science*. 24:423-459.
- Teutsch, C.D., J.H. Fike, G. Groover, and S. Aref. 2005. Nitrogen rate and source effects on the yield and nutritive value of tall fescue stockpiled for winter grazing. *Forage and Grazinglands*. Nine pp.
<http://www.plantmanagementnetwork.org/pub/fq/research/2005/winter/>
- Teutsch, C.D., J.H. Fike, and W.M. Tilson. 2005. Nitrogen fertilization rate and application timing effects on the nutritive value and digestibility of crabgrass. *Forage and Grazinglands*. <http://www.plantmanagementnetwork.org/pub/fq/research/2005/value/>
- Teutsch, C.D., J.H. Fike, G.E. Groover, and W.M. Tilson. 2005. Nitrogen fertilization rate and application timing effects on the yield of crabgrass. *Forage and Grazinglands*.
<http://www.plantmanagementnetwork.org/pub/fq/research/2005/yield/>
- Ervin, E. H., X. Z. Zhang, and J.H. Fike. 2004. Ultraviolet-B radiation damage on kentucky bluegrass. I. Antioxidant and colorant effects. *HortScience* 6:1465-1470.
- Ervin, E. H., X. Z. Zhang, and J.H. Fike. 2004. Ultraviolet-B radiation damage on kentucky bluegrass. II: Hormone supplement effects. *HortScience* 6:1471-1474.
- Ervin, E. H., X. Z. Zhang, and J.H. Fike. 2004. Ultraviolet-B radiation damage on kentucky bluegrass. III. Cultivar effects. *HortScience* 6:1475-1477.
- Fike, J. H., A.L. Buergher, J.A. Burger, and R.L. Kallenbach. 2004. Considerations for establishing and managing silvopastures. *Forage and Grazinglands*.
<http://www.plantmanagementnetwork.org/pub/fq/review/2004/silvo/>
- Saker, K.E., J.H. Fike, D.L. Ward, and H.P. Veit. 2004. Effects of Tasco (a seaweed extract) and heat stress on immune function of wether lambs. *J. Anim. Phys. Anim. Nutr.* 88:122-130.
- Fike, J.H., C.R. Staples, L.E. Sollenberger, J.E. Moore, and B. Macoon. 2003. Forage, supplementation rate, and stocking rate effects on cow performance. *J. Dairy Sci.* 86:1268-1281.
- Macoon, B., L.E. Sollenberger, J.E. Moore, C.R. Staples, J.H. Fike, and K.M. Portier. 2003. Comparison of three techniques for estimating forage intake of lactating dairy cows on pasture. *J. Anim. Sci.* 81:2357-2366.
- Fike, J.H., C.R. Staples, L.E. Sollenberger, J.E. Moore, and H.H. Head. 2002. Southeastern pasture-based dairy systems: housing, Posilac, and supplemental silage effects on cow performance. *J. Dairy Sci.* 85:866-878.
- Fike, J.H., V. G. Allen, R. E. Schmidt, X. Zhang, J. P. Fontenot, C. P. Bagley, R. L. Ivy, R. R. Evans, R. W. Coelho, and D. B. Wester. 2001. Tasco-Forage and antioxidant activity. Tasco-Forage: I. Influence of a seaweed extract on antioxidant activity in tall fescue and ruminants. *J. Anim. Sci.* 79:1011-1021.

Book chapters

- Fike, J.H., T.J. Butler, and R.B. Mitchell. 2014. Agronomy of switchgrass for biomass production. Pp 16-66 *In* H. Luo and Y. Wu (ed.). *Compendium of Bioenergy Plants: Switchgrass* CRC Press. 464 pp.
- Fike, J.H., D.J. Parrish, and W.B. Fike. 2013. Sustainable cellulosic grass crop production. Pp. 109-164. *In* B. Singh. (ed.) *Bioenergy Crop Sustainability*. Wiley-Blackwell. 480 pp.
- Fike, J.H. and D.J. Parrish. 2013. Switchgrass. Pp. 199-230. *In* B. Singh (ed.) *Biofuel Crops. Production, Physiology and Genetics*. CABI Publishers. 544 pp.
- Parrish, D.J. and J.H. Fike. 2009. Growth and production of herbaceous energy crops. *In*: *Soils, Plant Growth and Crop Production, Encyclopedia of Life Support Systems (EOLSS)*, W.H. Verheye (ed.). 31 pp. Developed under the Auspices of the UNESCO, Eolss Publishers, Oxford ,UK. [<http://www.eolss.net>]

- Parrish, D.J. and J.H. Fike. 2009. Selecting, establishing, and managing switchgrass (*Panicum virgatum*) for biofuels. In: J. Meilenz (ed.), *Methods in Molecular Biology: Biofuels. Methods and Protocols*. Springer/Humana. 280 pp.
- Allen V., J. Fike. 2009. H. A. Wallace, J. J. Ingalls, O. S. Aamodt and Other Early Voices of the 19th and 20th Centuries. In: W.F. Wedin and S.L. Fales (ed.), *Grassland. Quietness and Strength for a New American Agriculture*.

Extension bulletins

- Fike, J.H. A. Downing. 201X. Creating Silvopastures – Some considerations when planting trees into pastures. In review.
- Fike, J.H. A. Downing. 2016. Creating Silvopastures – Some considerations when thinning existing timber stands. In preparation.
- Fike, J.H. 2016. Defining silvopastures: Integrating tree production with forage-livestock systems for economic, environmental, and aesthetic outcomes. In press.
- Grisso R., J. Fike, D. Ohanehi, J. Perumpral. 2014. Large round bale safety. VCE Publication 442-455, (BSE-172P)
- Grisso R., J. Fike, D. Ohanehi, J. Perumpral. 2014. Management tips for round bale hay harvesting, moving, and storage. VCE Publication 442-454 (BSE-173P)
- Wolf D., J. Fike, C. Zipper. 2009. Conversion of Sericea Lespedeza-Dominant Vegetation to Quality Forages for Livestock Use. VCE Publication 460-119.
- Abaye A., G. Scaglia, J. Fike, R. Smith. Herbage Quality, Biomass, and Animal Performance of Cattle Part I: Forage Biomass, Botanical Composition, and Nutritive Values. November, 2009, ID 418-151.
- Abaye A., J. Rotz*, G. Scaglia, J. Fike, R. Smith. 2009. Herbage quality, biomass, and animal performance of cattle grazing. Publication Number 418-152
- Teutsch, C.D., and J.H. Fike. 2005. Forage establishment. Getting off to a good start. VCE Publication 418-120.
- Teutsch, C.D., and J.H. Fike. 2005. Putting the punch back into your pastures: pasture renovation. Publication Number 418-134.
- Teutsch, C.D., and J.H. Fike. 2005. Virginia's horse pastures: Forage establishment. VCE Publication 418-103.
- Teutsch, C.D., and J.H. Fike. 2005. Virginia's horse pastures: Renovating old pastures. VCE Publication 418-104.

GRANTS AND CONTRACTS – Last 5 years

- Advancing silvopasture as a conservation practice. IN REVIEW. USDA-NRCS. 2017-2020. \$1,147,519 (Total, including match = \$2,295,039.) Fike, Hession, Munsell, Pent, Polys, Sforza, Gagnon, Barlow, Mullenix.
- Hemp's feed and forage potential. John Lee Pratt Animal Nutrition Program. 2017-2020. \$95,000. Fike, Wilkinson, Wilson.
- The nutritional suitability of native warm-season grasses for equine. John Lee Pratt Animal Nutrition Program. 2017-2020. \$155,000. McIntosh, Fike, McKenzie, Tracy.
- Demonstrating conversion of wildtype to novel endophyte fescue pastures for greater livestock performance and better environmental outcomes. VA NRCS. 2016-2019. \$74,898. Fike, Teutsch.
- Determining scale characteristics of silvopasture in the US South. US Forest Service. 2016-2017. \$29,938. Fike, Munsell.
- Virginia hemp trials. Virginia Department of Agriculture and Consumer Services. 2016-2017. \$35,000. Fike.
- Young scholar enhancement grant. USDA-SARE. 2016. \$3500. Fike.

Managing toxic tall fescue with alternative legumes. John Lee Pratt Animal Nutrition Program. 2015-2017. \$92,220. Tracy, Fike, Xia.

Acoustic analysis: A novel way to measure livestock grazing behavior. Southern SARE. 2015. \$10,981. Pent, Fike.

Capacity building for agricultural education and research in Senegal. U.S. Agency for International Development (through OIRED). 2014-2016. \$483,000. Thompson, Thomason, Galbraith, Fike, Badgley, Tracy, Eick, Evanylo.

Assessing the impact of forage conservation method on ergovaline levels in tall fescue and subsequent performance of steers. CALS Capacity Building Grants. 2014-2016. \$50,000. Campbell, Teutsch, Fike.

Made in the shade – using silvopasture research and on-farm demonstrations to advance these sustainable agroforestry systems. Southern SARE. 2014-2016. \$190,000. Fike, Munsell, Teutsch.

Establishing and managing pine and hardwood silvopastures in the mid-Atlantic region of the United States. USDA-Virginia Natural Resource Conservation Service. 2013-2015. \$75,000. Teutsch, Campbell, Fike, Munsell, Frey, Downing.

Miscanthus feedstock research. DOE/SunGrant feedstock partnership. Idaho National Lab. 2015. \$20,000. Fike, Galbraith.

Switchgrass feedstock research. DOE/SunGrant feedstock partnership. Idaho National Lab. 2015. \$40,000. Fike, Galbraith.

Establishing silvopastures for cross-disciplinary research and capacity building. CALS Capacity Building Grant. 2014-15. \$50,000. Fike, Badgley, Campbell, Downing, Fiske, Frey, Munsell, Strahm, Teutsch.

Forage and animal nutrition research to improve silvopasture production systems. John Lee Pratt Animal Nutrition Program. 2014-2015. \$92,600. Fike, Greiner, Munsell.

Professional Development for Silvopasture Experimentation and Implementation. Va SARE Professional Development Grant. 2013. \$5,985. Fike, Frey, Downing, Munsell.

Prioritizing agroforestry outreach in Virginia's Chesapeake Bay Watershed Region. Virginia Department of Forestry. \$86,459. 2013-2016. Munsell, Blinn, Fike, Wynne.

Miscanthus feedstock research. DOE/SunGrant feedstock partnership. North Central SunGrant Center. 2007-2015. \$106,499 Fike, Galbraith.

Switchgrass feedstock research. DOE/SunGrant feedstock partnership. North Central SunGrant Center. 2007-2015. \$212,999. Fike, Galbraith.

Seed Technologies to Secure Rapid and Complete Switchgrass Establishment. DOE/SunGrant. 2011-2013. \$50,400. Fike (Co-Pi with multi-university grant).

AWARDS AND HONORS

2016 Drs. John and Shirley Gerken Professional Development Award for extension and outreach efforts.

2014 College of Architecture and Urban Studies Outreach Award. P. Kelsch, S Piedmont-Palladino, E. Wiseman, J. Fike., N. Heavers, J. Munsell.

2014 VCE Program Excellence Award. M. Booher, J. Benner, M. McCann, J. Fike, D. Fiske, C. Teustch, S. Greiner, C. Moulder, and J. Chambers. Statewide award for achieving excellence in “New Initiatives” with *Increasing Awareness of Prevention Methods for Fescue Toxicosis of Beef Cattle*

Honorable Mention - Outstanding Team Award. 2014. Silvopasture Diffusion through Extension and Partnering Agencies in the South. ANREP - Association of Natural Resource Extension Professionals. A. Downing, J. Fike, G. Frey, J. Munsell, C. Teutsch, T. Mize, J. Daniels.

2013 VCE Program Excellence Award. A. Downing, J. Fike, G. Frey, J. Munsell, C. Teutsch, T. Mize, J. Daniels. Statewide award for achieving excellence in “New Initiatives” with

Silvopasture: Conservation Innovation for Virginia's Agriculture and Natural Resource Professionals"

2013. Casey Tree Foundation's Master Plan Design Competition and Awards Program. For outstanding architectural and land use planning as part of a national land use plan competition. P. Kelsch, S Piedmont-Palladino, E. Wiseman, J. Fike., N. Heavers, J. Munsell.

Honored Researcher with the Korean National Livestock Research Institute, 2002-2005.

ADDITIONAL RESPONSIBILITIES

Department of Energy/North Central SunGrant Center. Feedstock Partnership. Switchgrass feedstock production lead.

PROFESSIONAL ACTIVITIES AND SOCIETIES

- Agroforestry Systems – Associate Editor
- American Society of Agronomy
- Crop Science Society of America
- Gamma Sigma Delta
- Sigma Xi